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71 Applicant : **JEYES GROUP plc**  
**Brunei Way**  
**Thetford**  
**Norfolk IP24 1HA (GB)**

72 Inventor : **White, Michael John Robert**  
**24 The Coppice**  
**Attleborough, Norfolk NR17 2PY (GB)**

74 Representative : **Lamb, John Baxter et al**  
**MARKS & CLERK,**  
**57-60 Lincoln's Inn Fields**  
**London WC2A 3LS (GB)**

54 **Bleach compositions.**

- 57 A thickened alkaline peroxide bleaching composition comprising :-
- (a) hydrogen peroxide ;
  - (b) water ;
  - (c) a stabiliser for the hydrogen peroxide ;
  - (d) a water-soluble electrolyte ; and
  - (e) a surfactant/thickening component comprising :
    - (i) an alkyl ether sulphate surfactant together with an amine oxide or betaine surfactant and, optionally, an alkane sulphonate surfactant ; or
    - (ii) an amine oxide surfactant together with a sarcosinate surfactant and, optionally, an alkane sulphonate surfactant.

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This invention is concerned with improvements in and relating to bleach compositions and, more particularly, is concerned with alkaline bleaches containing hydrogen peroxide as active bleaching component.

It is known to provide thickened cleansing compositions, that is cleansing compositions of increased viscosity, for application to inclined or vertical surfaces, whereby, due to the increased viscosity of the composition, the composition remains in contact with the surface for a longer period of time than an unthickened composition.

It is an object of the present invention to provide thickened aqueous alkaline peroxide bleaching compositions.

According to the invention there is provided a thickened alkaline peroxide bleaching composition comprising:

- (a) hydrogen peroxide;
- (b) water;
- (c) a stabiliser for the hydrogen peroxide;
- (d) a water-soluble electrolyte; and
- (e) a surfactant/thickening component comprising:
  - (i) an alkyl ether sulphate surfactant together with an amine oxide or betaine surfactant and, optionally, an alkane sulphonate surfactant; or
  - (ii) an amine oxide surfactant together with a sarcosinate surfactant and, optionally, an alkane sulphonate surfactant.

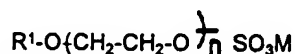
Compositions in accordance with the invention suitably contain from 0.1 to 10% by weight, preferably 3 to 6% by weight of hydrogen peroxide. In order to prevent or minimise decomposition of the hydrogen peroxide any water present in the composition should be deionised water and, further, compositions in accordance with the invention contain a stabilising system for the hydrogen peroxide. Suitable stabilisers comprise phosphonic acid derivatives such as that sold under the Trade Name Mykon CIX - (1,2-cyclo-hexanediylbis[nitrilobis(methylene)]) tetrakis, sodium salt.

The compositions of the invention are alkaline and should contain an alkali, typically an alkali metal hydroxide, especially sodium hydroxide, to maintain the desired pH, eg. a pH from 7.0 to 10, preferably 8 to 9.

The composition may also suitably contain a buffer such as an alkali metal borate in an amount sufficient to buffer the composition at the desired pH, eg. in an amount of from 0.1 to 2.5% by weight, typically about 0.5% by weight.

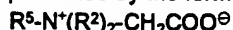
In addition to the alkali and buffering agent, a composition in accordance with the invention should contain a neutral water-soluble electrolyte since such is required to give an appreciable thickening effect in the presence of the surfactant/thickening components called for in accordance with the present invention. Typically, sodium chloride serves as electrolyte but, of course, other neutral water-soluble salts may be employed such as, for example, potassium chloride, magnesium sulphate etc. The electrolyte should suitably be present in an amount of from 0.1 to 15% by weight, preferably 5 to 10% by weight.

In accordance with a first embodiment of the invention, the surfactant/thickening component comprises an alkyl ether sulphate surfactant together with a betaine or amine oxide surfactant and, optionally, an alkane sulphonate surfactant. Suitable alkyl ether sulphate surfactants may be represented by the formula:



in which  $R^1$  is a  $C_8$ - $C_{20}$  alkyl group, preferably a  $C_{10}$ - $C_{14}$  alkyl group; and M is an alkali metal or ammonium cation, generally a sodium ion.

Suitable betaine surfactants may be represented by the formula:

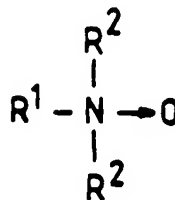


in which  $R^2$  is a  $C_1$ - $C_4$  alkyl group, typically a methyl group, and  $R^5$  is a group  $R^1$  or an alkylamide group of the formula:



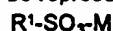
in which  $R^4$  is a  $C_1$ - $C_4$  alkyl group, typically a propyl group.

Suitable amine oxide surfactants have the formula:-



in which R<sup>1</sup> and R<sup>2</sup> have the meanings defined above.

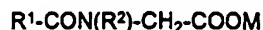
Suitable alkane sulphonate surfactants may be represented by the formula:



in which R<sup>1</sup> and M have the meanings defined above.

Typically such thickening components may be present in amounts such as to afford from 0.1 to 7.5%, preferably 0.2 to 2.5% by weight of alkyl ether sulphate surfactant; from 0.1 to 7.5% by weight, preferably from 0.2 to 2.5% by weight of betaine surfactant; and, when present, from 0.05 to 2.0% by weight of alkane sulphonate surfactant.

Suitable sarcosinate surfactants for use in accordance with the second embodiment of the invention may be represented by the formula:



in which R<sup>1</sup>, R<sup>2</sup> and M have the meanings defined above.

When the surfactant/thickening component system is in accordance with the second embodiment of the invention, the amine oxide is suitably present in an amount from 0.1 to 7.5% by weight, preferably 0.2 to 2.5% by weight; the sarcosinate is suitably present in an amount from 0.05 to 5% by weight, preferably 0.1 to 2.5% by weight; and the alkane sulphonate, when present, in an amount from 0.05 to 5, preferably 0.5 to 2.5% by weight.

It should be noted that whilst the use of the thickening components noted above will commonly give clear thickened compositions, this will not always be the case, depending on the nature and amount of the thickening components. However, it is a matter for simple trial and experiments to ascertain whether any particular combination will give the desired results.

Thickened bleach compositions in accordance with the invention may also contain other ingredients, especially perfume, which are suitably present in amounts of from 0.01 to 1% by weight.

In order that the invention may be well understood the following examples are given by way of illustration only. In the Examples all percentages are by weight unless otherwise stated.

### Examples

Thickened alkaline hydrogen peroxide - containing components were made up from the following base compositions:-

|                        |           |
|------------------------|-----------|
| Hydrogen peroxide      | 5.0%      |
| Sodium borate          | 0.5%      |
| Sodium hydroxide       | to pH 8.5 |
| Stabiliser (Mykon CIX) | 0.1%      |
| Soft water             | to 100.0% |

Thickened compositions were made from the base composition by incorporating therein two or more of a ether sulphate surfactant (Empicol ESB3M), an amine oxide surfactant (Empigen OB), salt, a betaine surfactant (Tegobetaine F), an alkane sulphonate surfactant (Hostapur SAS 30X), and a sarcosinate surfactant (Hamposyl L30) in the amounts shown in the following tables, the base formulation being used in an amount to bring the total of ingredients up to 100%.

Table 1

| Example | Lauryl ether sulphate (%) | Amine oxide (%) | Salt (%) | Viscosity (cp) |
|---------|---------------------------|-----------------|----------|----------------|
| 1       | 4                         | 3               | 5        | 54             |
| 2       | 5                         | 3               | 5        | 164            |
| 3       | 6                         | 3               | 5        | 14             |
| 4       | 4.5                       | 1               | 5        | 56             |
| 5       | 4.5                       | 2               | 5        | 84             |
| 6       | 4.5                       | 3               | 5        | 114            |
| 7       | 4.5                       | 4               | 5        | 158            |
| 8       | 4.5                       | 5               | 5        | 40             |
| 9       | 5                         | 3               | 0        | 12             |
| 10      | 5                         | 3               | 2.5      | 275            |

Table 2

| Example | Lauryl ether sulphate (%) | Betaine (%) | Salt (%) | Viscosity (cps) |
|---------|---------------------------|-------------|----------|-----------------|
| 11      | 3                         | 4           | 5        | 15              |
| 12      | 4                         | 4           | 5        | 144             |
| 13      | 5                         | 4           | 5        | 295             |
| 14      | 6                         | 4           | 5        | 460             |
| 15      | 4                         | 2           | 5        | 240             |
| 16      | 4                         | 3           | 5        | 185             |
| 17      | 4                         | 4           | 5        | 145             |
| 18      | 4                         | 5           | 5        | 130             |

Table 3

| Example | Lauryl ether sulphate (%) | Amine oxide (%) | Alphane sulphonate (%) | Salt (%) | Viscosity (cps) |
|---------|---------------------------|-----------------|------------------------|----------|-----------------|
| 19      | 5                         | 4               | 1                      | 5        | 840             |
| 20      | 5                         | 4               | 2                      | 5        | 730             |
| 21      | 5                         | 4               | 3                      | 5        | 615             |
| 22      | 5                         | 4               | 4                      | 5        | 550             |
| 23      | 5                         | 4               | 5                      | 5        | 480             |
| 24      | 2                         | 4               | 5                      | 5        | 415             |
| 25      | 3                         | 4               | 5                      | 5        | 290             |
| 26      | 4                         | 4               | 5                      | 5        | 480             |
| 27      | 5                         | 4               | 5                      | 5        | 475             |

Table 4

| Example | Lauryl ether sulphate (%) | Amine oxide (%) | Alphane sulphonate (%) | Salt (%) | Viscosity (cps) |
|---------|---------------------------|-----------------|------------------------|----------|-----------------|
| 28      | 1.5                       | 4               | 1                      | 5        | 340             |
| 29      | 1.5                       | 4               | 2                      | 5        | 130             |

Table 5

| Example | Amine oxide (%) | Sarcosinate (%) | Salt (%) | Viscosity (cps) |
|---------|-----------------|-----------------|----------|-----------------|
| 30      | 6               | 1               | 5        | 14              |
| 31      | 6               | 2               | 5        | 22              |
| 32      | 6               | 3               | 5        | 24              |
| 33      | 6               | 4               | 5        | 21              |

Table 6

| Example | Amine oxide (%) | Sarcosinate (%) | alhare sulphate (%) | Viscosity (cps) |
|---------|-----------------|-----------------|---------------------|-----------------|
| 34      | 7               | 3.5             | 0.5                 | 52              |
| 35      | 7               | 3.5             | 1.0                 | 70              |
| 36      | 7               | 3.5             | 1.5                 | 110             |
| 37      | 7               | 3.5             | 2.0                 | 125             |
| 38      | 7               | 3.5             | 2.5                 | 127             |

### Claims

1. A thickened alkaline peroxide bleaching composition comprising:-
  - (a) hydrogen peroxide;
  - (b) water;
  - (c) a stabiliser for the hydrogen peroxide;
  - (d) a water-soluble electrolyte; and
  - (e) a surfactant/thickening component comprising:
    - (i) an alkyl ether sulphate surfactant together with an amine oxide or betaine surfactant and, optionally, an alkane sulphonate surfactant; or
    - (ii) an amine oxide surfactant together with a sarcosinate surfactant and, optionally, an alkane sulphonate surfactant.
2. A thickened alkaline peroxide bleaching composition as claimed in claim 1 substantially as hereinbefore described with reference to the Examples.



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(71) Applicant : **JEYES GROUP plc**  
**Brunel Way**  
**Thetford**  
**Norfolk IP24 1HA (GB)**

(72) Inventor : **White, Michael John Robert**  
**24 The Coppice**  
**Attleborough, Norfolk NR17 2PY (GB)**

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**MARKS & CLERK,**  
**57-60 Lincoln's Inn Fields**  
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(54) **Bleach compositions.**

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# EUROPEAN SEARCH REPORT

Application Number  
EP 95 30 0897

| DOCUMENTS CONSIDERED TO BE RELEVANT   |  |  |   |
|---|--|--|---|
| Category  | Citation of document with indication, where appropriate, of relevant passages  | Relevant to claim  | CLASSIFICATION OF THE APPLICATION (Int.Cl.6)    |
| X   | DATABASE WPI<br>Section Ch, Week 9323<br>Derwent Publications Ltd., London, GB;<br>Class A97, AN 93-185370<br>& JP-A-05 112 798 ( DAINIPPON JOCHUGIKU KK) , 7 May 1993<br>* abstract * | 1  | C11D3/39<br>C11D17/00<br>C11D1/83<br>C11D1/94   |
| X   | DATABASE WPI<br>Section Ch, Week 9119<br>Derwent Publications Ltd., London, GB;<br>Class D25, AN 91-138082<br>& JP-A-03 076 799 ( SUN POLE KK) , 2 April 1991<br>* abstract *          | 1  |   |
| Y   | WO-A-93 14183 (PROCTER & GAMBLE) 22 July 1993<br>* page 10, line 31 - page 12, line 14;<br>claims 1-6; examples 1 2E-H 5 *   | 1  |   |
| Y   | EP-A-0 376 704 (UNILEVER PLC ;UNILEVER NV (NL)) 4 July 1990<br>* claims; examples *  | 1  | TECHNICAL FIELDS<br>SEARCHED (Int.Cl.6)<br>C11D |
| A   | EP-A-0 404 293 (CLOROX CO) 27 December 1990<br>* page 7, line 50 - line 56; examples *   | 1  |   |
| A   | DATABASE WPI<br>Section Ch, Week 9125<br>Derwent Publications Ltd., London, GB;<br>Class A97, AN 91-182435<br>& JP-A-03 111 494 ( LION CORP) , 13 May 1991<br>* abstract *             | 1  |   |
| The present search report has been drawn up for all claims  |  |  |   |
| Place of search<br>THE HAGUE  |  | Date of completion of the search<br>19 September 1995  | Examiner<br>Grittern, A                         |
| CATEGORY OF CITED DOCUMENTS   |  | T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>A : member of the same patent family, corresponding document |   |
| X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : see-written disclosure<br>P : intermediate document |  |  |   |

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